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ABSTRACT

Richard Paul is one of the leading figures in the critical thinking movement. Paul defines critical thinking as disciplined, self-directed thinking that exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking. This definition of critical thinking also takes into account the interests of diverse persons or groups. Moreover, Paul maintains that "future logic," in contrast to "past logic," drives the entire critical thinking movement because the pace of change has accelerated to the point that the future becomes the past faster than at any time in human history. This paper seeks to explore Paul's "strong sense" critical thinking, and does so by summarizing six presentations on the subject delivered at the International Conference for Critical Thinking held in 1991. The report also offers a redefinition of Paul's construct that includes the feminist perspective and the multicultural perspective put forth by two of the presenters. It ends with a knowledge-as-design analysis of both Paul's definition and the revised, more inclusive definition. A 14-item list of references is included. (DB)

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" Education is no substitute for intelligence. That elusive quality is defined only in part by puzzle-solving ability. It is in the creation of new puzzles reflecting what your senses report that you round out the definition."

Frank Herbert
Chapterhouse Dune.

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Unpacking Richard Paul's Strong Sense Critical Thinking

Reflection on the 11th Annual International Conference for Critical Thinking

at Sonoma State University, Rohnert Park, California, August 4-8, 1991

by

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Abstract: Richard Paul's bellwether construct, strong sense critical thinking, is examined through the lenses of six presentations at the 11th International Conference on Critical Thinking and revised to include the feminist perspective of Barbara Thayer-Bacon and the multicultural perspective of Maulana Karenga.

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4 August 1991. Richard Paul stood on the open grounds of the commencement area behind the Commons at Sonoma State University and welcomed 1,500 or so critical thinkers representing every continent on Earth. This was the 11th annual international conference the Center for Critical Thinking and Moral Critique had sponsored at the idyllic, 30 year old state university in Rohnert Park California, 50 miles south of San Francisco.

A philosopher, master teacher, organizer and author of one of the field's most important books to date, Dr. Paul had become a leading spokesperson for the critical thinking movement sweeping North America and the world. His Sunday morning address set the tone for the four day conference that featured 300 presentations. When finished talking, he had outlined core concepts of critical thinking and its historical context.

Paul said critical thinking

- is openminded and disciplined
- requires thinking about thinking
- includes examination of background logic made up of assumptions, sources of information, concepts, points of view, associations and inferences
- has direction (a starting point and a purpose)
- features judgment

He also said "future logic," in contrast to "past logic," drives the entire critical thinking movement because the pace of change has accelerated to the point that the future becomes the present faster than any other time period in human history. In the 1990s, a fact in any given field may have the life span of a mayfly.

Paul reasoned that the short life of facts exposed the fallacy of teaching students reams of isolated details soon outdated. Instead, he suggested that students be taught to think critically about themselves and the world. Teaching critical thinking can be a constant in the midst of quick paced change.

Paul's gold, shoulder length hair complimented his blue Wall Street suit and waved with every hand gesture made to accent key points in the talk. He left the Sunday morning congregation charged with a final thought: **"What is an educational system that teaches for the future?"**

Thus the tone was set.

I had traveled 3,000 miles from Philadelphia to examine Richard Paul's **strong sense critical thinking**. My task began with narrowing down the 300 conference presentations to a manageable few that might shed light on Paul's notion. I participated in twelve presentations. Of those, six were especially useful for understanding Paul's construct.

This report, then, summarizes those six presentations illuminating Paul's strong sense critical thinking. Moreso, the report offers a redefinition of the construct--one that includes the feminist perspective of Barbara Thayer-Bacon and the multicultural perspective of Maulana Karenga. It ends with a knowledge as design analysis of both Paul's definition and the revised, more inclusive definition.

In "Critical Thinking and the Challenge of Modern Education," one of four lectures published in *Critical Thinking as a Philosophical Movement* by Ripon College Press, 1989, Richard Paul had offered the following definition.

"Critical thinking is disciplined, self directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking."

Paul adds, when such thinking is "disciplined to serve the interests of a particular individual or group," it is weak sense; on the other hand, when it is "disciplined to take into account the interests of diverse persons or groups," it is strong sense. In Paul's view, weak sense critical thinkers are people who exclude or distort ideas that fail to serve their own viewpoints, whereas, strong sense critical thinkers are people who are fairminded, able to empathize with viewpoints that may even oppose their own.

This was the definition I sought to unpack.

The twelve sessions were as follows.

4 August 1991

Robert Swartz, Sandra Parks Black

Infusing Critical and Creative Thinking into Content Area Instruction

Richard Paul

The Elements of Thought: Basic Building Blocks of a Reasoning Mind

Matthew Lipman

Higher-order, Complex Thinking

5 August 1991

Barbara Thayer-Bacon

A Feminine Perspective on Critical Thinking Theory

Richard Paul

Developing a model for k-12

Reform Based on Critical Thinking: 17 Underpinnings

Maulana Karenga

Reconstructing the Feminism of Anna J. Cooper: An Exercise in Critical Recovery

6 August 1991

Richard Paul

Richard Paul's Bag of Tricks: Getting Students involved

Barbara Thayer-Bacon, Charles Bacon

Real Talk: How to Lead a Classroom Conversation and why you should

James O' Conner

Research Findings on the Effects of Implementing Critical Thinking

7 August 1991

Robert Byrd

Critical Reasoning as Practical Epistemology

James O' Conner, Richard Paul, Diane Halpern

Comparing Critical Thinking Perspectives: Cognitive

Psychology vs. Philosophy—A Panel Discussion

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Richard Paul's Sunday afternoon talk, " Basic Elements of Thought," offered early insights about strong sense critical thinking. Matthew Lipman's model of higher order thinking provided a contrasting perspective. On Monday, Barbara Thayer-Bacon and Maulana Karenga filled in Paul's definition by adding feminists and multicultural perspectives. On Tuesday, James O' Conner added a research perspective from his review of the literature about the effectiveness of critical thinking programs. And on the final day, Wednesday, the panel discussion became a debate between Diane Halpern, representing the cognitive psychology perspective on teaching critical thinking, and Richard Paul, representing philosophy.

First, Richard Paul's Sunday afternoon presentation was held in the Evert B. Person Theater. At 1:30 P. M. He took the stage and promptly began talking without introduction. He said the purpose of this session was to identify the basic building blocks of reasoning. Moreso, those building blocks are what thought is made of:

- point of view
- purpose and direction
- concepts
- assumptions
- data gathering & interpretations
- theories
- inferences
- implications

Together, these building blocks of reasoning form the background logic behind modes of thought expression, i.e. speaking and writing. Most noteworthy, they form more of the ideas behind strong sense critical thinking.

A strong sense critical thinker--when reflecting on his or her own thought--will ask at least these questions:

1. What is my point of view on this problem or issue?
2. What do I want to achieve from my thought?

These questions could be asked of any speaker or writer under examination. For example, Richard Paul's point of view in this presentation was of a philosopher/innovator interested in providing an audience of critical thinkers with key background concepts about the field. He wanted to achieve a common understanding of ideas participants could use to improve both their own thinking and the thinking of other presenters to come.

Such a critical thinker may also wish to examine the concepts, assumptions, data, theories, inferences, and implications of his or her own thinking and the thinking of others. That, in fact, is the pattern which connects the key ideas in his presentation with strong sense critical thinking.

Strong sense critical thinkers examine the background logic of self and others.

While Paul's presentation was entertaining as well as informative, the exercise he used to model how the basic building blocks could apply in the classroom was not effective. He asked participants to select a partner and think about friendship. Then the partners were to examine different issues, assumptions, data and inferences about the concept. What was missing was a mode of thinking expressed in a form that could then be examined. If, for instance, each person had written a definition of friendship and cited examples of friendship in their own experience and/or in literature, a starting point for the thinking would have been provided. There would have been something to think critically about. There would also have been a clearer context.

As it was, the exercise failed because participants did not explore the background logic behind their thinking. They had to first clarify the context and figure out their respective definitions of friendship. Then they set about examining background concepts as time ran out.

And to those of us who had attended the earlier Robert Swartz and Sandra Parks Black presentation in which participants examined in depth the critical thinking and historical context that led Rosa Parks to defy the white southern bus driver who had ordered her to give up her seat, Paul's exercise seemed thin. The concept of friendship without clear context paled when compared to the real life drama of civil rights.

In all though, his presentation reviewed key ideas participants could put to use right away to become better strong sense critical thinkers. Also, it contributed to my understanding of the critical thinking movement because the movement itself has background logic that needs continuous examination and revision. And as I struggle to find ways of teaching critical thinking across the fifth grade curriculum at an urban elementary school, it will be important to hold Paul's ideas in mind for self understanding as well as understanding perspectives different from mine. Such is the stuff of a becoming a strong sense critical thinker.

Matthew Lipman contrasted Richard Paul in both form and idea. Like a Joe Montana with blonde hair, Dr. Paul gave a presentation, that appeared rehearsed, though skilled and dramatic. He seemed to be selling his ideas about basic building blocks of thinking.

Dr. Lipman took the stage at Person Theater at 3:15 Sunday afternoon. Though I had seen Adlai Stevenson only in pictures, Dr. Lipman, I imagined, could have been the statesman's twin. An inquisitive professor, confident, though open to new possibilities, he came to us as a learned participant in knowledge making, one willing to floodlight dark areas of ignorance about what we don't know yet as well as one willing to put what is known, from his perspective, into the sunlight.

I remembered the Zen story about the bright American student who visited a Zen master in China. The student attended the master's tea for the purpose of learning more about Zen. The student was full of questions and even more full of answers. When it was time to pour water for tea, the master filled the student's cup then kept pouring.

The surprised student asked why the master was spilling hot water onto the table. The master replied " you are like this cup, full and overflowing. I can teach you nothing."

Sitting on the front row of a packed house, I came before Dr. Lipman as an empty cup.

Dr. Lipman's raised several questions in his presentation, " Higher-Order, Complex Thinking." Among them were these two:

1. How do we teach students to make judgments?
2. How might the field of teaching thinking describe its key concept?

While the first question might be answered in his Philosophy for Children program for teaching thinking, Dr. Lipman's presentation simply raised it. He did, however, offer what was one of the clearest descriptions of higher order thinking I have yet to encounter.

In Dr. Lipman's model, **higher order thinking** has two aspects:

- It is complex.
- It is inventive.

The complex side of higher order thinking is substantive, procedural, and pluralistic, while the inventive side is both critical and creative.

For him, substantive, first order thinking, means inquiry into a particular subject. procedural, second order thinking, means inquiry into inquiry. And pluralistic, third order thinking, means examination of other thinking positions while at the same time advancing one's own position. Thus the complex side of higher order thinking has three fluid dimensions.

Unlike Paul's perspective, Lipman sees the need to include both creative and critical thinking in his model. For Paul, strong sense critical thinking is a creative process. For Lipman, higher order thinking is based on critical and creative thinking.

Below is a table that highlights Dr. Lipman's view of critical and creative thinking as they comprise the inventive aspect of higher order thinking.

TABLE : MATTHEW LIPMAN'S VIEW OF CRITICAL AND CREATIVE THINKING

Critical thinking	Creative thinking
1. single criteria	1. multiple criteria
2. conducive to judgment	2. conducive to judgment
3. self-correcting (seeks truth)	3. self-transcending (rise above opposing values and ideas)
4. sensitive to context	4. governed by context

Finally, if Dr. Paul had been in the audience he might have taken issue with Dr. Lipman on his description of the pluralistic part of complex thinking. From Richard's perspective, examining several other thinking positions while at the same time advancing one's own might lead to weak sense critical thinking. A person or group might for selfish reasons assess the thinking of others in order to best advance an ego centered position.

Dr. Paul might say only the strong sense critical thinker learns from the contrasting positions of others and uses those counterpoints to change his or her own thinking.

He would be more in line with the discussion David Bohm, the physicist and science philosopher, gave about scientific paradigms in his book *Science, Order, and Creativity*.

Bohm had been suggesting how scientists could break out of the Khunian notion that fresh ideas come only during a period of revolution. He suggested a way to sustain creativity in science that sounds more like Paul's strong sense critical thinking than Lipman's pluralistic thinking.

Bohm asked this:

"Is it possible for science to move in a new direction in which greater freedom for the play of thought is permitted and in which creativity can operate *at all times*, not just during periods of scientific revolution?"

He answers in the following.

Given that the focusing of work in any given field, through the action of a paradigm, gives rise to an excessive rigidity of mind, it was suggested that a better approach is to allow for a plurality of basic concepts, with a constant movement that is aimed at establishing unity between them. Free creative play with ideas would aid in this process and could help scientific thinking to move in fresh and original ways. If this were the case, science would no longer become so rigid that a revolution would be required to bring about basic changes. Indeed this whole process would represent a significant move toward liberating the surge of creativity that is needed to help in confronting the deeper problems of humanity. It is therefore proposed here that such an approach would give rise to a generally better way of doing science than is possible with the traditional approach.

What connects the views of Drs. Lipman, Paul and Bohm is the gathering of multiple perspectives. For Lipman, a thinker examines the thinking of others in order to understand different views before advancing his or her own. This is pluralistic thinking. For Paul, a thinker examines the thinking of others in order to improve his or her own. This is strong sense critical thinking. For Bohm, a scientist entertains multiple viewpoints to foster creativity. This is the creative free play of ideas. While each of these men share the multiple perspective dimension, they differ in what purpose multiple perspectives might serve.

The third of the six presentations shedding light on Richard Paul's strong sense critical thinking was Barbara Thayer-Bacon's Monday morning talk. She proved that critical thinking was not a white, male province. Her talk, "A Feminist Perspective on Critical Thinking Theory," gave the notion of strong sense critical thinking more depth--which from the perspective of Taoism would mean more balance, yang finally meeting yin.

Dr. Thayer-Bacon had recently defended her dissertation on Richard Paul's critical thinking program and had just accepted a teaching position at Bowling Green University. After introductory remarks and a brief examination of weaknesses in Richard Paul's notion of critical thinking, she highlighted ideas from feminist theory that might expand his concept.

The stated purpose of her talk was to view critical thinking from the perspective of feminist theory. Her unstated purpose, though, was to balance Paul's strong sense critical thinking.

Dr. Thayer-Bacon said feminist theory offered five ideas to add to notions of critical thinking:

- cooperation
- nurturing
- values
- communication
- sharing

Though she presented these ideas as shorthand for a larger work from her yet to come, reading between the lines, there are implications for how strong sense critical thinking might be taught. Cooperative learning groups provide a social context for growing critical thinkers. The teacher nurtures these groups. Teaching values rides along side teaching concepts. Communication requires understanding ideas in context and emphasizes sharing of self with others.

With an assertion that knowing is a process of human relationship, she continued with a brief description of ways of knowing from a female perspective.

Women know through

- silence
- received knowledge
- subjective/intuitive knowledge
- procedural/objective
- constructed

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I imagine that Barbara Thayer-Bacon's idea about silence holds roots in ancient thought systems such as Vedic science--the tradition giving birth to Transcendental Meditation. She knows about the power of silence as a source of intellectual development. 25 years of research, for example, supports Transcendental Meditation's claim that experiencing silence and using a mental mantra develops both intellectual abilities and a sense of oneness. Recently, thinkers, such as David Bohm, have intuited a deeper level of connectedness between all things. Bohm's implicate order, for instance, can best be known through silence.

Richard Paul's strong sense critical thinking, ironically, would have a bottom usually provided by the bass fiddle if it were revised to include Dr. Thayer-Bacon's feminist notion of silence.

It is worth noting, in addition, that the use of silence as a way of knowing is not especially female. Jesus Christ used silence to hear God. Maharishi Mahesh Yogi used silence to connect with the unified field of consciousness. Buddha used silence to experience oneness. Dr. Thayer-Bacon may wish to reexamine her assumption that silence is exclusively a female way of knowing.

Dr. Cutler, a Professor of History at Temple University, when commenting on an earlier draft of this paper, explained that what Dr. Thayer-Bacon might have meant by received knowledge is traditional wisdom. I had been unclear about her meaning.

It is clear, however, that her subjective/intuitive and procedural/objective pairing do aid in a revision of Paul's strong sense critical thinking. Richard Paul leaves little room for these Taoistic dualities in his definition. For example, take her subjective/intuitive knowledge factor and examine this idea about a young, brilliant scientist who has been pioneering discoveries in chaos theory.

Mitchell Feigenbaum is said to have made discoveries about chaos theory while walking along the grounds of Los Alamos National Laboratory in New Mexico. His intuitive based flashes about the mathematics of order in chaos while experiencing silence and observing a stream of water led to furthering the emerging theory that James Gleick feels rates with Einstein's theory of relativity and Heisenburg's quantum mechanics as the most important scientific contributions of the 20th century.

Yet, subjective/intuitive knowledge, like silence, seems to have no role in Paul's strong sense critical thinking.

Constructivism. Dr. Thayer-Bacon's fifth idea about female ways of knowing that should be considered when thinking about strong sense critical thinking, has roots in Jean Piaget's work at the Center for Genetic Epistemology which began looking at constructivism in Geneva Switzerland in the late 1920s. Around the same time Lev Vygotsky in Russia was working out a constructivist theory from a social cognition perspective, in contrast to Piaget's developmental view. Both men seem to have made deeper contributions to the constructivist view of critical thinking than has feminist theory. And in fairness to Richard Paul, one of the strengths of strong sense critical thinking (as detailed in his landmark book, *Critical Thinking: What every person needs to survive in a rapidly changing world*) is his assertion that **thought constructs knowledge**.

Constructivism is not just a female way of knowing. It is a human way. So much so that Howard Gardner at Harvard University embeds constructivism in his definition of intelligence: "...the ability to solve problems and fashion products valued in one or more cultural settings."

However, certainly, Paul's definition of strong sense critical thinking might be revised to include Barbara Thayer-Bacon's feminist concepts: cooperation, values, silence, and intuition.

In all, the feminist view of critical thinking theory left me open to new possibilities for revising Paul's definition. Barbara Thayer-Bacon's discussion of having "sympathy," feeling with--which she said originally meant understanding other people's ideas from their points of view, made me want to echo her words: "open my mind and heart to embrace the world."

That afternoon, Maulana Karenga, founder of Kwanza, a major African American holiday, gave the most electrifying presentation of those I attended. The lecture room used for his talk held 50 people and, as Dr. Karenga noted, it was without windows. He said last year when discussing the dialectics of Malcolm X, the room was larger and had windows. This year his presentation was buried in one of Darwin Hall's most obscure settings, a small, hard to find, science lecture room.

Still exhilarated from Barbara's talk, I had showed up for Maulana's presentation one hour early.

The abstract of Dr. Karenga's presentation had said the following.

Maulana Karenga

Professor of Black Studies, CSU Long Beach

**Reconstructing the feminism of Anna J. Cooper:
An Exercise in Critical Recovery**

The thrust of this paper is to engage in a process of critical recovery of the feminist philosophy of Anna J. Cooper. It involves delineating and examining major aspects and contentions of her thought which both exemplify and encourage critical thinking. Critical recovery is posed as an essential form and task of critical thinking, a kind of intellectual archaeology and reconstructive hermeneutics directed toward unearthing and extracting messages and meaning from heretofore suppressed voices and discourses. Cooper, as both an African and a woman, represents both in what she is and what she says--an opportunity for multicultural exploration and exchange. Her thought will be posed in a dialectical form of resolving tensions which compose and inform her social context and moral universe, i.e., tensions between consciousness and conditions, race and gender, male and female, power and knowledge, human constraints and human possibilities.

I wanted to be near the front, so with my brown bag lunch of California fruits, juice, and spring water in hand, I entered the lecture room and took a seat on the second row. Forty-five minutes later (which was really fifteen minutes before the presentation) Dr. Karenga entered the room with two very attractive women escorting him. All three were regally dressed in African garb.

By starting time, the small room had neared capacity. It seemed that most of the Africans and African Americans attending this conference of 1,500 international critical thinkers were in this room, ready to hear Dr. Karenga deliver the word.

Dr. Karenga, a professor of Black Studies, brought to my mind a story historian Edward Robinson tells to illustrate the powerful intelligence found in American folks of African descent before school systems teaching uncritical thinking denuded their ability to be critical thinkers.

There were two babies born the same day on Masa John's plantation. One born to his wife Missy Jane, the other born to Bertha Sue, his slave cook. About six months after the birth of these children Missy Jane's baby boy said, "Dada."

Missy Jane ran down the steps to tell the world about her little genius. "He said dada! He said dada!"

"He said his first word!" she exclaimed.

She ran through the kitchen shouting praises of her child's remarkable linguistic ability.

Bertha Sue's six month old little boy turned to his mother and said "Hey Ma, what was Missy Jane making all that fuss about?"

Dr. Karenga had just earned his second Ph. D.

Almost 20 years before the critical thinking movement in North America had reached its present level of maturity, Maulana Ron Karenga had invented the Nugzo Saba, seven principles serving as the cornerstone for Kwaidera, the philosophical system behind the Kwanza holiday and the underpinnings of present day Afrocentricity.

Yet deep within the interior of Darwin Hall, here he was in a room without windows (or camera man to video tape his presentation).

Dr. Karenga said the purpose of his talk was to describe how critical recovery fused feminist thought and Afrocentricism in a new methodology for examining suppressed texts. He then walked participants through his model.

For him, critical recovery takes the writing of a person such as Anna Julia Cooper and places the text in its historical context beginning with "locating the writer in that context. For example, Anna J. Cooper, a slave woman who gained emancipation, became a college graduate, earned a master's degree from Oberlin University in 1882, earned a Ph. D. from the University of Sourborne in Paris, and published a landmark feminist text that had been suppressed for almost 100 years. She worked for women's rights and African American rights up to her death at 104 years old.

Dr. Karenga then cited several points to be considered in recovering her text.

•**truth as whole**

Truth requires both male and female perspectives. That is the lesson of Cooper's *Voice from the South*, a feminist counterpart to works by males such as W. E. B. Dubois.

•**standpoint**

Her standpoint is fundamentally Afrocentric, yet decidedly as a female leader of the reconstruction period, post civil war.

•**theme**

In her defense of the weak, she dealt with both racism and sexism. And she challenged African American men to become non sexist people able to treat women humanly as a measure of their own humanity.

•**vision**

Cooper envisioned a world in which African men and women would teach the world a new way of knowing. As she remarked about the racists and sexists men of her time, Cooper said one should not cut off her legs to accommodate a small thinker. But rather one should encourage the small thinker to grow taller.

Karenga felt that recovering Cooper's text offered numerous opportunities for critical thinking and could be stated in a three step model. **Critical Recovery** means to

1. describe the historical context and locate the author in that context;
2. reconstruct the historical message; and,
3. expand the meaning in light of present historical context.

While Dr. Karenga's presentation lived up to its promise of offering enlivened dialogue amongst himself and the participants, and while his model seems to encourage dialectical thinking, there was little in his talk to support his ending claims. He said epistemology must reflect our stance as oppressed people and our resistance to oppression. Also that our goal should be a multicultural education focused on critical thinking.

It is hard to argue for or against those points without understanding Karenga's background logic. Yet no further discussion examined these ideas more closely. Time ran out.

It remained unclear, for example, why he assumed the perspective of oppressed African American people resisting oppression. Just as a half glass of water could be seen as half empty or half full, he had a choice. He might have said African American people are in the process of full emancipation. He could have linked teaching critical thinking and liberation, an approach Paulo Freire described as problem posing education in his *Pedagogy of the Oppressed*.

But even without further discussion, the multicultural point seemed rich enough to leave me wondering how many critical thinking programs attempted to discuss ideas across contrasting cultural frames of reference. Even a Jr. Great Books program assumes that works from Western civilization have more value. Like *Animal Farm* where all animals are equal, though some (the pigs) are more equal than others, all world literature holds value, but Western literature has more value than others. That is what the Great Books advocates would have us believe.

I have since been working on the problem of including multicultural as well as feminist perspectives in my revised version of Richard Paul's strong sense critical thinking and in my day to day teaching of critical thinking across the curriculum at Pennell Academic Plus in Philadelphia.

Also, I have begun reading Howard Gardner's *To open minds*. In this book, he contrasts a progressive American perspective on education and a Chinese one. He feels the counterpoint offered by the Chinese method of educating for excellence enriches his efforts to understand the development of multiple intelligences here.

Karenga and Gardner seem to be kindred spirits.

When I had left Philadelphia at 7:00 A.M. Saturday morning, the predicted high for Philly had been in upper 90s. When I arrived at San Francisco International Airport at noon, it was a fog covered, drizzling 68 degrees. For three days running, the temperature at Sonoma State never seemed to rise above the 60s. But that Tuesday afternoon, the temperature had reached the 80s. It seemed hot.

Inside Stevenson Hall, 15 minutes after Ron Karenga's brilliant discussion, James O' Conner opened his session with remarks far more blistering than the heat outside.

An Educational Psychologist, Dr. O' Conner said, the evidence shows that teaching critical thinking does not have any effect on student ability to think critically. Macmillan, for instance, in 1987 reviewed 27 studies of the effects of critical thinking and found that not one demonstrated gains. The best that could be said from Macmillan's view was that students who attended college showed more gains in critical thinking ability than students who did not.

16 of the 27 studies used the Watson-Glaser Critical Thinking Assessment--a measure O' Conner felt was not sensitive enough to catch small gains in critical thinking ability, especially in short term studies.

In O' Conner's own review of the literature, he examined two data bases ≥ 1985 : ERIC showed 84 works and Psychological Abstracts showed 20 works when critical thinking and research were used as major descriptors. Dr. O' Conner concluded from his examinations the following:

- Other holes in the research were the effect critical thinking had on parent child relations and self esteem.
- A lack of qualitative studies existed.
- A need for sensitive instruments to measure critical thinking was dire.
- A shift from objective multiple choice tests to " authentic assessments " must be furthered.

Dr. O' Conner ended the presentation with a brief description of an IBM backed research project in Northern California schools. The project was to develop multiple qualitative elements of authentic assessments.

It is worth noting that Dr. O' Conner's review did not cite a single study in which Richard Paul's strong sense critical thinking had been the subject of experimental or descriptive research. Dr. Thayer-Bacon's recent dissertation on Paul's construct may be the first critical examination of the idea as it works in an educational setting.

Also, because the Greensboro, NC public school system has adopted Richard Paul's approach to the development of strong sense critical thinking, new 1990s research is almost certain to happen.

More immediate to Dr. O' Conner's review was the fact that he missed Nancy Stahl's Delphi study, a dissertation she completed at Arizona University in 1990. In this study, Stahl presented a consensus definition of critical thinking and its attributes. Then she used the definition to examine four leading programs for critical thinking. She ranked each program for its fit with the consensus definition and the number of attributes of critical thinking each one developed.

Participants standing with their backs to the Stevenson building on Sonoma State's quad were treated to the postcard picture beauty of California hills: patches of green sprinkled on golden brown, drought driven grass like rolling scoops of ice cream above the ultra modern, gray stone gymnasium across campus.

Just inside Stevenson, room 1002, Richard Paul, Diane Halpern, and James O' Conner had gathered scores of participants for their panel discussion of the state-of-the-art in the critical thinking field from the perspectives of cognitive psychology and philosophy. This was for many the most attractive of the 13 final choices offered during the last slot before the conference came to a close.

The discussion opened with Dr. Halpern saying this session had the feel of a heavy weight bout.

" In this corner, wearing purple trunks, Diane Halpern..."

200 or so members of the audience laughed.

Then she said the discussion should be a sharing of ideas instead of a fight between a philosopher and a cognitive psychologist.

Dr. Paul sat back in his chair and nodded agreement. With the tension softened, Dr. Halpern went on the attack.

What caught my eye though was not the spirited debate between two friends mindful of entertaining a few hundred critical thinkers. Rather what stood out were the questions that synthesized both perspectives. It seemed relatively unimportant that many philosophers were stuck on problems that bore little relationship to real world problems. Nor did it seem to matter that cognitive psychology drew life from information processing theory and therefore was mechanistic. But the following questions emerging from Halpern and Paul's debate did matter.

1. How can I know my students have become strong sense critical thinkers? What critical thinking performance should students be able to do at the end of their work at Pennell Academic Plus in Philadelphia?
2. Does an assessment of critical thinking based on portfolios, video tapes, and projects yield a more accurate view of student achievement than traditional standardized multiple choice tests? Do holistic measures such as the National Assessment of Educational Progress Criterion Reference Scale for Extended Definition or the National Intellectual Standard offer teachers an appropriate tool for measuring critical thinking?
3. Does the critical thinking movement offer opportunities for redressing long standing inequalities in educational opportunities and outcomes?
4. Does Taoism offer a way of integrating insights from philosophy and cognitive psychology into programs that produce strong sense critical thinkers?
5. Might the development of a critical mass of strong sense critical thinkers be, on the one hand, the best means of achieving the ancient Greek ideal of having well informed citizens capable of full participation in a democratic society and, on the other hand, serve as the best means of preparing a nation for a 21st century economy based on the creation and distribution of knowledge?
6. Might a sufficient amount of wisdom needed to solve global, non linear problems emerge from a nation of critical thinkers?
7. Might an international critical mass of critical thinkers serve as the cornerstone of Yoneji Mausuda's vision of the evolution of homo sapiens to homo intelligens?

The purpose of this paper, however, was not to answer the above questions. Instead I want to return to Richard Paul's definition of strong sense critical thinking and offer a revision that grows out of unpacking his notion, particularly as informed by Barbara Thayer-Bacon's feminism and Maulana Karenga's suggested multicultural perspective.

Ever since Fritjof Capra published the *Tao of Physics*, stir frying Eastern mysticism and Western science in the same electric wok, Taoism has found a home in a range of fields including leadership, peace, time management, and sexual relationships. In what might be called the Tao of Critical Thinking, Richard Paul's strong sense critical thinking can be revised to include, explicitly, feminist and multicultural perspectives.

For example, reconsider this:

" Critical thinking is disciplined, self directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking."

That is Richard Paul's definition of critical thinking which becomes strong sense critical thinking when it is " disciplined to take into account the interests of diverse persons or groups."

Next consider this:

Strong sense critical thinking is the dialectical examination of multiple points of view including an exploration of the background logic behind those positions. Throughout this process of cooperative exploration of ideas and values, reflection comes into play. Such reflection may be constrained by requirements of a specific domain while at the same time drawing on intuitive insights springing forth from multiple disciplines and cultures.

At the 4th Annual International Conference on Critical Thinking, David Perkins, a Harvard University Professor, had introduced conferees to **knowledge as design** one week before his book of the same title was released. He opened the presentation by asking participants to think of insightful statements about a coffee cup. In less than 5 seconds he told them their time was up. The conferees were packed in a classroom. To a fire marshall's chagrin, extra people sat in the aisle. All participants seemed to gasp at once having failed to meet the challenge in the short time given them.

Perkins laughed then explained how knowledge as design, a system for critical and creative thinking, focused on generic features of ordinary, everyday objects and wonderful ideas--from coffee cups to Einstein's theory of relativity. From Perkins' view, all knowledge, whether a concrete object or abstract claim, has a purpose, structure, model case and argument.

Thus four questions can be raised to ferret out insightful observations.

- What is the purpose?
- What is the structure?
- What are the model cases?
- What are the arguments (explanatory, evaluative, deep explanatory)?

Perkins' method can be used to make insightful statements about a coffee cup or the two definitions of strong sense critical thinking.

Reframed, the knowledge as design questions become as follows.

1. What is the purpose of each definition of strong sense critical thinking?
2. How is each definition structured?
3. What model case of each definition exists?
4. What pattern connects both definitions?
5. How might each definition be evaluated?
6. Does a meta model emerge from a larger framework?

So given, the knowledge as design questions organize insightful statements about both definitions, and it sums the analysis, concisely, in the following outline.

design analysis for two definitions of strong sense critical thinking

	Paul	Fluellen
purpose	define critical thinking in a way that captures the notion of fairmindedness and highest order	define critical thinking in a way that uses Paul's as a reference point but that includes key feminist and multicultural elements
structure	presents several key code words: disciplined, self directed, perfection of thought, domain of thinking--each code word deepens the meaning	presents several key code words: dialectical, multiple perspectives, cooperative exploration, ideas and values, reflection, intuitive insights, multiple, disciplines and cultures--each code word deepens the meaning
model case	draws on his vast experience as a professional philosopher and master teacher	draws on Basseches' Neo Piagetian construct ("dialectical thinking") and Taoism

arguments

Explanatory level: Patterns which connect

Both definitions contrast lower order types of thinking. Both include creative thinking as a vital part of what it considers to be critical thinking. Both are theory based conceptual definitions. Paul's definition also contrasts with weak sense critical thinking. Fluellen's definition includes feminist, afrocentric and multicultural perspectives.

Evaluative level

Paul's definition is more concise and is consistent with a number of other definitions in the literature on critical thinking. Fluellen's definition breaks with other definitions to the degree that it deliberately seeks to include feminist and multicultural thought. Both definitions seem to meet most of the ten criteria set forth in the National Intellectual Standard.

Note.

In a landmark review article (" A Proposal for the National Assessment of Higher-Order Thinking "), Richard Paul and Gerald M. Nosich offer the following statement.

" In its exemplary form, (critical thinking) is based on universal intellectual values that transcend subject-matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness." This is the gist of the National Intellectual Standard.

deep explanatory level: Meta patterns which connect

While Richard Paul's view of strong sense critical thinking has been made operational in a set of K-12 materials and staff development for teachers in the Greensboro, NC Public School System and many schools across the nation, Fluellen's view has not been operationalized. However, beyond Paul and Fluellen, there seems to be a meta model that connects Freire's problem posing education, Bohm's generative order, strong sense critical thinking, Collins' cognitive apprenticeship, and Gardner's definition of intelligence ("...the ability to solve problems and fashion products of value in one or more cultural settings ") This meta model has not as yet been operationalized either. It is a gleam in the eye.

My redefinition of Richard's bellwether construct aside, how I teach the 1992-1993, 5th grade curriculum at Pennell Academics Plus Elementary School in Philadelphia will rely on the materials he has developed to revise lessons in elementary science, social studies, and language arts. I will not reinvent the computer. Dr. Paul and members of the National Council of Excellence in Critical Thinking have already operationalized teaching strong sense critical thinking. Moreso, his approach fits nicely with Paulo Freire's observation in *Pedagogy of the Oppressed*.

" True dialogue cannot exist unless the dialoguers engage in critical thinking--thinking which discerns an indivisible solidarity between the world and men and admits of no dichotomy between them--thinking which perceives reality as process, as transformation, rather than as a static entity--thinking which does not separate itself from action, but constantly immerses itself in temporality without fear of the risks involved ."

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